INTEROFFICE MEMORANDUM

TO: MEMBERS, STATE BOARD OF EDUCATION

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SUBJECT: NEW MEASURE OF ACADEMIC PROGRESS (MAP)

DATE: JULY 31, 2006

At the study session of March 29, the Board was presented with proposed changes to the AZ LEARNS school profile for 2006. The details could not be developed and presented until ADE received the 2006 test results. That time has arrived.

This memo presents proposed changes to the Measure of Academic Progress, or MAP. The MAP is a student-level measure of academic growth. It is a component of the AZ LEARNS achievement profile for schools, reported separately to the public, and is used by some schools as a pay-for-performance measure for teachers. In previous years, the MAP was calculated using the Stanford 9 since this was the only test given at all grade levels 2 through 9.

In 2004 the law was changed to permit a more meaningful analysis than the previous statute, which specified that MAP be measured as the percent of students who made one year's growth. However, changes in testing delayed implementation of the revised statute until this year. Now that the AIMS is administered in every grade, we have the opportunity to measure progress on growth measured against state standards. This is far more meaningful than the earlier measure. ADE is requesting that the Board approve the proposed changes to MAP based on the AIMS for the AZ LEARNS school profile.

Incorporation of the proposed new MAP requires three actions described in this memo:

1. Approval of a new method for calculating MAP.

2. Approval of a new scale to incorporate MAP performance into AZ LEARNS.

3. Approval of an AZ LEARNS performance scale for schools that do not have MAP scores.

KEY FEATURES

The proposed new MAP was developed after seven months of analysis at ADE and consultation with school administrators, testing experts, and outside consultants. These advisors advocated and suggested that the new MAP have several key features. The proposed MAP embodies these:

- The proposed MAP provides as much continuity as possible with the former MAP.

- The proposed MAP provides a diagnostic measure of performance for individual students.

- The proposed MAP sets meaningful and realistic goals for student growth.

- The proposed MAP is calculated in a statistically sound manner.

Again, the most important feature of the new, proposed MAP is that it is based on growth against state standards instead of a national norm or average.

SOME HISTORY

The Measure of Academic Progress is the state's original measure of school performance. It preceded AZ LEARNS and was incorporated into the AZ LEARNS school profile. When the MAP was developed, the only test given statewide at all grades was the Stanford 9. The Stanford 9 is a norm-referenced test so student performance was measured against a national average instead of a state standard i.e. student's were told that they performed in the 35th or 75th percentile, not that they met or did not meet state standards.

The former MAP deemed a student to have made one-year's-growth (OYG) if that student held steady against the national average. For example, if a student was in the 35th percentile in the fourth grade and was in the 35th percentile or higher in the fifth grade, that student was considered to have made one year's growth. In fact, the expectation of growth allowed students to slip behind by as much as 17 percentile points and still be considered to have made OYG.

MAP scores for schools were found by calculating the percentage of students in a school making OYG in math and in reading. Schools were then awarded points in the AZ LEARNS formula for the percentage of students making OYG.

Last year, 2005, was a transition year for MAP. In 2005 a new testing contractor brought with it a new norm-referenced test, the TerraNova/AIMS DPA to replace the Stanford 9. A study commissioned by ADE found that the new norm-referenced scores in 2005 were not comparable at the individual level to the 2004 Stanford 9 scores. Consequently, a transition MAP was approved by the Board with the expectation that it would be a one-year stopgap, and that in 2006 a new, AIMS-based MAP would take its place.

HOW THE NEW MAP WORKS

The proposed new MAP has three straightforward steps:

1. An individual expectation of one year's growth (OYG) is calculated for each student.

2. The expectation of OYG is subtracted from the actual growth achieved by the student to determine a Growth Index.

3. The average growth index for school is calculated by averaging growth indices for individual students across all grades and subjects. Schools are awarded AZ LEARNS points based on this average.

Actual growth, expected growth, and the growth index are expressed in AIMS scale score points.

Calculating expected growth

As mentioned before the proposed new MAP was developed after extensive study and consultation. The method for calculating expected growth proposed here is similar to that used in other states: Texas, Mississippi, North Carolina.

Expected growth for each student is calculated using the tables below. Each student starts with a baseline expectation of growth. This baseline is then adjusted for a ceiling effect. This takes into account the fact that the higher the student's score in the previous year, the less growth is possible. The table below, for 7th grade math, provides a typical example. Students who were in the lowest AIMS performance level, Falls far below, on the 6th grade math test in 2005 grew over three times as much on average as students who scored in the highest.

Performance Level on 6th Grade Math Test	Average Growth
Falls far below	39.4
Approaches	33.8
Meets	28.2
Exceeds	11.6

After adjusting for the ceiling effect, the growth expectation is then adjusted for student mobility as required by state law [ARS 15-241(F)]. Students who spend the entire year in the same school are expected to grow more than those who transfer to a school in the middle of the year.

The formula used to calculate expected OYG is:

Expected OYG = (Baseline Growth) + (Adjustment for Ceiling Effect) X (Score in Previous Year) + Adjustment for Student Mobility.

Example. Student A scored 478 on the 6th grade math test in 2005. She has been enrolled in her current school all year. Her expected OYG for 7th grade in 2006 is 121.1295 + (-0.1896) X 478 + 7.1203 = 37.62 = 38.

Example. Student B scored 490 on the 4th grade reading test in 2005. He has not been enrolled in his current school for the full year. His expected OYG for 5th grade in 2006 is 153.1619 + (-0.2879) X 490 = 12.09 = 12.

The following tables give the baseline growth and adjustments for each subject and grade.

MATH			
Student's Grade Previous Year	Baseline Growth	Adjustment for Ceiling Effect	Adjustment for Student Mobility
3	98.9308	-0.1514	6.027
4	107.7715	-0.174	5.7754
5	75.6373	-0.1268	6.999
6	121.1295	-0.1896	7.1203
7	54.1785	-0.0823	7.0308

READING			
Student's Grade Last Year	Baseline Growth	Adjustment for Ceiling Effect	Adjustment for Student Mobility
3	120.9638	-0.2269	3.7108
4	153.1619	-0.2879	4.106
5	105.8317	-0.2016	4.343
6	88.3119	-0.1492	5.1193
7	89.8856	-0.1688	7.0786

The former MAP was only calculated for reading and math. It is the recommendation of our advisory group that this continue to be the case and MAP not be calculated for the AIMS writing test.

The growth expectations are meaningful and realistic

The growth expectations were developed by starting with averages of the actual student level growth experienced from 2005 to 2006. These averages were then tweaked so that students starting in the lowest AIMS performance level, Falls Far Below, would reach proficiency by the time they left eighth grade. The growth expectations are meaningful because they require students to attain proficiency. They are realistic because they are based on average statewide performance. The growth targets can and are being reached by many schools in the state.

Determining the Growth Index

Once expected OYG is calculated for a student, it is then subtracted from the actual change in scale score for the student from one year to the next to calculate the student's Growth Index for that subject.

Example. Student A scored 478 on the 6th grade math test in 2005. Her expected OYG for 7th grade in 2006 is 38. In 2006 she scores a 528 on the 7th grade math test. Her actual growth is 528 – 478 = 50. Her growth index is 50 – 38 = 12.

Example. Student B scored 490 on the 4th grade reading test in 2005. His expected OYG for 5th grade in 2006 is 12. In 2006 he scores a 500 on the 5th grade reading test. His actual growth is 500 – 490 = 10. His growth index is 10 – 12 = -2.

MAP for schools

The Growth Index for a school is calculated by averaging the student-level growth indices across all grades and subjects. Since growth indices are based on state averages that have only been slightly adjusted, the average student growth index statewide is nearly zero. Based on MAP scores calculated using scores from 2005 and 2006, the average school-level growth index for the state is -1.1. Half the schools in the state have a growth index between -5.3 and 3.6. The maximum school growth index is 78.0 and the minimum is -38.8.

AWARDING AZ LEARNS POINTS

In previous years, schools were awarded AZ LEARNS points for MAP based on a scale with discrete jumps like the one below. This table was used last year.

Percent of Students Making OYG	Points Earned
0-24	2
25-49	4
50-74	6
75-100	8

Schools have complained about the jumps caused by this type of scale, e.g. a school drops from 51 percent to 49 percent and loses two points—a significant drop in the AZ LEARNS formula. To remedy this, it is proposed that a continuous scale be used. The scale was developed in order to minimize as much as possible the difference between the number of points earned by schools in 2005 and in 2006. The number of AZ LEARNS points earned by a school is calculated with the following formula:

AZ LEARNS points = 5.2 + .22 X (School's growth index.)

As with last year, the scale is bounded at the bottom by 2. So if the result of the above formula is less than 2, a school would earn 2 points. No maximum is placed on the number

of points a school may earn. This is to award schools that make outstanding growth with students.

Example. School A's growth index is -1.7. The number of AZ LEARNS points awarded to the school is 5.2 + .22 X (-1.7) = 4.8.

Example. School B's growth index is 3.2. The number of AZ LEARNS points awarded to the school is 5.2 + .22 X (3.2) = 5.9.

Example. School C's growth index is -20.0. Since 5.2 + .22 X (-20.0) = 0.8 is less than 2. The number of AZ LEARNS points awarded to the school is 2.

The table below compares MAP points earned in 2005 to points earned via the method proposed here. The average school earns 0.1 more points than last year under the system proposed here.

Year	Average	25th Percentile	50th Percentile	75th Percentile	Maximum	Minimum
2005	4.9	4	4	6	12.3	2
2006	5.0	4.1	5	6	8	2

SCHOOLS WITHOUT MAP

Schools that do not receive MAP points in AZ LEARNS are:

1. High schools
2. Alternative schools
3. K-2 schools
4. K-3 schools
5. Schools with less than 16 students in the MAP analysis

In cases one through three, the issue of not having MAP has already been addressed in the profile calculation for those school types. Case four is a new situation arising from the fact that MAP is no longer calculated for third grade. In previous years MAP was calculated using the state's norm-referenced test which is given in grades two through nine, so it was possible to measure change in student scores from grade two to grade three. Under this proposal where MAP is calculated using AIMS, which is not given in second grade, it is impossible to include third grade students in the MAP analysis. There are about 66 out of over 1300 schools in cases four and five.

This memo proposes an alternate AZ LEARNS scale for schools in cases four and five above. The scale was constructed so that the MAP and non-MAP profiles would be as congruent as possible. To do this, we compared the points earned by schools in the 2005

AZ LEARNS profiles with and without MAP. We then constructed a scale so that as many schools as possible would earn the same profile without MAP points as they would if MAP points were included. The table below shows the current scale that includes MAP, the proposed non-MAP scale, the distribution of schools in 2005, and the distribution of schools without MAP points and using the proposed scale.

			Distribution of Schools	
Profile	**Current Scale**	**Non-MAP Scale**	**2005 with MAP Included**	**Using Proposed Non-MAP Scale**
Underperforming	<13	<8	6%	8%
Performing	13-15.9	8-12.9	34%	55%
Performing Plus	16-27	13-19	31%	12%
Highly Performing	16-18.9	13-14.9	15%	14%
Excelling	19-27	15-19	13%	12%

Example. School A is a K-3 and hence does not have a MAP score. It must earn 8 points to be a performing school.

Example. School B is a K-6 and hence does have a MAP score. It must earn 13 points to be a performing school.

The largest impact of MAP is moving schools from the performing level to the performing-plus level. The exclusion of MAP would have minimal impact on the percentage of schools in other achievement levels under non-MAP scale.